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Edited by JOHN BARTLETT.

PHOTOGRAPHIC THEORIZING.

IT has not been a very long time since we devoted a little space in our columns to the matter of scientific *versus* photographic education, and spoke of the different ways in which our art was studied by the practical photographic operator and the theoretical man of science.

The gist of what we then said was that the photographer, as a general rule, trained himself to the producing of certain results with his chemicals, and did not stop to theorize upon the matter, while the scientifically-educated amateur was too apt to neglect the practical parts of the art for the sake of visionary speculations.

The old conflict of theory *versus* practice is seen every day in an art like photography. We constantly meet with photographers who make excellent work, and yet are so ignorant of the principles involved in the production of the said work, that it seems wonderful they should be favored with so fair a share of success. And it is no less wonderful, on the other hand, that men who have been blessed with every opportunity of acquiring a fine scientific education, should so often be wanting when they take up an art as practical in its nature as photography.

Our attention has been recalled to this matter by some curious assertions made by an English traveler upon the subject of exposure. The man was highly educated, as his whole style as an author proves. He undertook a voyage around the world for the purpose of making meteorological and photographic observations, and in numerous instances has succeeded well in the photographic portion of the work. We cannot speak of the other part. But on reading over his experiences, which are always interesting and well told, we see that he has fallen into just such an error as we might expect from one who had busied himself with the exactitudes of meteorological science rather than with the everyday routine of photography.

Let us relate this error in his own words. He says: "At Yokohama I at last found time to have the photographs developed, and the result brought forcibly home the well-known fact that photography is very slow in the tropics, although the light is strong and bright. Few, of which the exposure had been so long that a cap could be used, were underdone, as I had taken care to give plenty of time; but all attempts at instantaneous photography with a snap shutter failed, with one exception, from under-exposure. The reason is undoubtedly to be found in the enormous

absorption of the sun's chemical rays by the large amount of vapor ever present in tropical air. The spectroscope shows this partly by the thickness and darkness of the rain lines near D, and of the alpha and *a* lines, all in the yellow and red; but curiously enough, there is very little apparent difference in the appearance of the blue end of the spectrum. In cloud photography the best results are not got either near the equator or the pole, but in middle latitudes; and the greatest rapidity is certainly found in the same countries as those in which the best clouds are taken. In northern climates there is the weak power of a low sun to contend against, as well as the effects of haze and fog; while near the equator the absorbent power of water vapor often makes the exposure too long for successful instantaneous photography. A cubic foot of air in Colorado will often contain twelve grains of water vapor, while the same volume of air in Italy will not hold more than two or three grains of the same water stuff."

How true the facts above quoted are, in all except the photographic sense!

It used to be said of a man starting to circumnavigate the globe that he was a bold man; but to our minds he is a much bolder one who will attempt thus roughly to reduce photographic exposure to a fixed unit, so to speak, and overlook the allowances that have to be made for the variations in character of subject, and in behavior of chemicals at different times. This alone would be enough; we say nothing of the variations that would have to be expected in the sensitive plates.

Again, it is undoubtedly true that the light of tropical regions is very strong,—crude indeed. But did it ever occur to those who photograph in these regions that such intense direct sunlight casts shadows which are correspondingly dark and crude? Did it ever occur to them that fearing over-exposure from the brilliancy of the high lights, they were in reality *undertiming* the shadows? The old photographic maxim, "expose for the shadows, and the lights will take care of themselves," is quite as true at the present day as it ever was.

But this is not all. The complaint is made that it was instantaneous exposures, or "snap-shots," that failed. Can it really be possible for a man to suppose his exposure properly regulated in point of chemical effect when he "snaps" indiscriminately at any and every kind of subject? Whether it be a view made from the vessel's deck close in shore on dark buildings and forests, or a view of a ship with her sails brilliantly lighted in the sun in mid ocean, and suppose the same lens, same stop, same drop, and same plate would be used, and then instead of ascribing the failures to their true causes, we should have spectroscopic and meteorological reasons pleaded in behalf of this or that theory as to why the failures occurred.

The old saw "practice makes perfect," if laid to heart by those who try to reduce the exposures of photographic plates to a scientific system, would be worth a vast deal of theorizing.

Before the introduction of gelatine plates, when the whole paraphernalia for wet collodion had to be carried to the field and the plates developed on the spot, it was much easier to tell exactly whether the plate had been accurately timed or not. Taking an average, commonplace subject, such, let us say, as a light-colored stone house, with trees pretty close to it, a good operator used to find that the exposures would be fairly constant, whether the said house was in Philadelphia, Cochin China, or Iceland. The amount of watery vapor present in the air was not taken into consideration,

neither were the Fraunhofer lines of the spectroscope. The operator of those days knew that he must be perfectly familiar with his lens, and be able to reckon what time to give the plate with a certain stop. He also had to know the sensitiveness of his collodion and silver bath, and reckon from these known quantities how strong the developer should be. Complicated as these points may seem to the modern amateur, it was possible to go about one's work on the average subject quoted above with great certainty. Many operators of the present day, like the one we have been speaking about, seem to think more of spectroscopic and meteorologieal charts than of the known sensitiveness of their chemicals and plates.

The training of the eye, or the acquiring of photographic vision, to put it in other words, could not have claimed any great share of attention in the case we have quoted. To return for a moment to our example of the wet collodion operator; an important part of his business was to so train his sight that he could *estimate exposures;* and to make any progress in this direction, he had to study the color and light and shadow existing in his subjects; this being done, the right use of the chemicals was a comparatively easy matter. But the amateur of to-day begins by disregar ding everything like a consideration of dark or light subjects,—of average ones like the house with trees, or of unusual ones like white buildings in a glaring sun, with dark cypress trees in the foreground, or, on the other hand, like cottages in parks in northern climates, where the foliage is dark and heavy, and casts a non-actinic gloom over the objects below, which are often brown and green in color, and require exceedingly long exposures.

We might go on *ad nauseam* to give examples of subjects differing in their chemical actinism. But we hope that we have said enough to set those of our readers to thinking a little, who might suppose that photographic exposures could be reduced to a fixed rule. An assertion that instantaneous exposures in tropical regions fail from undertiming, and that the cause is to be looked for in the large quantity of water in the atmosphere, as proved by the spectroscope, is very misleading to the practical photographer, and, let us add, highly unscientific. As we have been saying, if photographic timing could be made a fixed or mechanical matter, there might be an opportunity for a consideration of these other branches of science.

A trip around the world with the photographic camera, and with or without spectroscopes and charts, is a very delightful thing. We hope that a good number of our readers may be fortunate enough to make such a one. Those who can not, will find much entertainment in reading the Hon. Ralph Abercromby's book entitled "Seas and Skies in Many Latitudes," which is the work we refer to. There are many things said in it well worthy of being remembered, but we advise all who read it to forget the ideas advanced by the author on photographic exposures.

ON DEVELOPMENT WITH PYROGALLIC ACID IN CONNECTION WITH AMMONIA IN VAPOR.

THE use of vapors in picture making was one of the first methods. The polished silver plate being exposed to iodine vapor to make it sensitive, and after exposure to that of mercury to develop the image, was the process of early days.

Since then there does not seem to have been any use of vapor, except for fuming silvered albumen paper.

In the use of ammonia vapor I have found by a few crude experiments that the modern dry plate may be developed by soaking for a minute or so in a plain solution of pyro in water, and then exposing to the fumes of ammonia, again returning it to the pyro bath, followed by the ammonia vapor, thus alternating until sufficient density is obtained.

There does not seem to be much difference when the vapor is used before the bath (of course first wetting the plate), though more careful experiments may show an advantage.

I find that a plain strong pyro solution acts most rapidly, but too powerful a vapor acts too strongly, and is liable to produce red and green fog.

I think that a solution of pyro with any preservative that could be used with ammonia as the alkali, might also be used with ammonia vapor, and the alkali having kept separate from the pyro, it might be used repeatedly, as the action goes on mostly while under the influence of the vapor, and it seems to be necessary only to swab the plate with the pyro solution.

Perhaps the most valuable quality of this process is the ability it gives to localize and control development, as any part of a plate may be built up while other parts are left nearly or entirely undeveloped. By holding the plate film side down over an open bottle of ammonia (which may be warmed a little to increase the vapor), the image is slowly or rapidly developed, according to the distance above the mouth of the bottle. Four or five inches high diffuses the vapor sufficiently for uniform action over a 5 x 7 plate, and for local action down to ½ inch, according to the strength of the vapor.

An open dish can be used, and probably a small hose from the mouth of the bottle would work for local development with film upwards.

The above process is equally applicable to intensification with bichloride of mercury solution, and the action can be carefully watched, so that only those parts needing extra density need have full exposure to the fumes.

It seems necessary that the plate should be evenly wet or damp all over to get uniform action, but I found no difficulty about that.

The advantages seem to be especially the local action without hard lines, and the pyro does not darken even in plain solution nearly so quickly as when the alkali is mixed with it, and probably by the use of a swab or brush, without immersing the plate in the solution, it could be preserved and used over and over again.

THEO. H. LUDERS.

ON THE DENSITY OF INTENSIFIED NEGATIVES.

A communication to the Photographic Society of Great Britain.

NATURALLY, intensification of a negative has frequently to be touched upon by writers on photographic matters, but there seems to be only what I may term a qualitative knowledge of its nature. Indeed, the statements about density of deposit have always been more or less random. It was to see whether the density given by intensification had any exact relationship to the density given by mere development of a negative that my time has to a certain extent been employed. In a paper which I read at the Camera Club Conference, and which has appeared in its proceedings, and in the pages of the photographic papers, I showed that the transparency of the different squares of a negative taken in a Spurge's sensitometer obeyed the law of error when the transparency of the square areas was represented by the ordinates to the curve, and the holes which admitted the light were taken as the abscissæ. I explained that the particles of silver reduced by the developer must be looked upon as being scattered at random over the different areas, and that the transparency of the negatives was caused by the light penetrating through the interstices left by these particles. In a paper read subsequently at the British Association, and which was afterwards printed in an amplified form, it was shown that there was more than a probability that the *number* of particles deposited during development varied directly as the intensity of the light which previously had acted, and that the reason why the transparency of the different small areas did not also vary directly was due to the over-lapping of particles owing to the random scattering. When the particles are once distributed, and intensification is carried out, it remained a question, hitherto unsolved, as to whether the diminished transparency obeyed any law. The sole answer possible to this question, it appeared to me, could only be arrived at by direct experiment. It must be borne in mind that the positions of all the particles of silver which have been reduced by development are fixed; and it was a question if the intensified negative might not obey the same law as the unintensified negative. It must not be forgotten that intensification by the ordinary mercury and silver method implies that each particle of silver is increased in size, and that therefore in all probability the same formula would apply to the intensified negative as it did for the unintensified one. The experiment was carried out in the following manner:—A plate was exposed in a Spurge's sensitometer for a time sufficient to give nearly opacity on the area to which the greatest intensity of light was admitted, *i. e.*, with the light coming through the largest hole. The usual alkaline developer was employed. After development the plate was fixed, and the different opacities measured in the manner I have described on previous occasions. The curve was then plotted, taking for abscissæ the number of the holes of the sensitometer, and for the ordinates the transparency of each part. The theoretical curve was then calculated as is ordinarily done, and the observed and calculated values, when compared, show their agreement. The negative was next intensified by the mercury and silver process. It may perhaps be of value, and make this paper more complete, if the formula for

the intensification be given, more especially as I wish to call attention to the fact that negatives I have treated with it remained unchanged, which unfortunately is not the case with the old mercury method, I have called this in one of my works "the best intensifier," and I certainly think it so :—

1.

Bichloride of mercury	100 grains.
Bromide of potassium	100 grains.
Water	10 ounces.

2.

Silver nitrate	100 grains.
Water	10 ounces.

To this last is added a 100-grain (to the ounce of water) solution of potassium cyanide till the precipitate first formed is just *not* entirely dissolved. The plate is immersed in No. 1 till it bleaches thoroughly. It is then washed copiously and immersed in No. 2 till it is blackened right through the film; and again thoroughly washed. The sensitometer negative thus treated, after drying, was measured for a transparency. On applying the formula $T' = Te^{-ux^2}$, x in terms of light, intensity being $2^{\frac{x}{3}}$ where u is the intensity of the light, where T is the total transparency, and T′ that passing through a hole No. x, x being reckoned in this case and in the preceding from the hole in which no deposit was to be seen. It was found that the formula applied in this case as it did in that of the unintensified negative. The zero of the abscissæ was found to be the same in both cases, as might be expected from the nature of things.

In the ordinarily developed negative u was found to be .00603, while for the same negative when intensified $u = .01015$. Total transparency T having measured 80° on the rotating sectors, the formulæ became in the two instances $T' = 80e^{-.00603x^2}$ and $T'' = 80e^{-.01015x^2}$ when T′ and T″ are the transparency of the deposits in the ordinary and in the intensified negatives respectively.

We thus find that $\frac{T'}{T''} = e^{.00412x^2}$, which shows that the density obtained by intensification is not directly proportioned to that existing in the simply developed negative, as many have imagined, but increases more rapidly,—in fact, as the logarithm. The gradation is much more rapid in the intensified negative than in its original state. It is not hard to calculate what the difference in gradation is, for we shall find it when the intensities of the light come in through any particular square of the sensitometer. This being so, we have $Ie^{-.00603x^2} = .01015x^2$. Taking logarithms on both sides of the equation we get $\frac{x}{x'} = 1.297$. That is, the range of gradation of the one is about 1.3 times that of the first one, the range being reckoned as derived from the sensitometer. If a little thought be given to a negative that requires intensification, it will be seen that the highest light falls short of anything like good opacity. Suppose that the greatest opacity was such that 1-10 of the light passed through it, then by intensification the density would be so increased that only 1-40 of the light would pass. For printing purposes the 1-10 transparency is nearly equal to total opacity. But the fact must not be lost sight of that intensification is absolutely hurtful if the opacity in the high lights is what it should be without it. The details in the high lights, which may be very delicate shades of light, will be represented very nearly

as opaque as the highest lights themselves, and they will appear as blanks when the negative comes to be printed.

I trust that the results I have given will be of some scientific value, for the more we know about quantitative photography the more useful we make the art generally. I dare say to a large majority of those attending the meeting this paper will be voted as too mathematical; but I think even a dull mathematical paper, if it contains anything novel, should be read before the Society, whose *raison d'être* is to foster not only the art side, but also the scientific side of photography. I can conceive of no greater proof of this than to look at these walls on which are so many splendid examples of art, and then on the black board, where we can see formulæ and apparently shapeless curves. The connexion between the two may seem remote, but I believe that it is by fostering the latter that the former will make any real progress.

W. DE W. ABNEY, R.E., C.B., D.C.L., F.R.S.

PHOTOGRAPHING THE BABY.

YOU want something practical for your magazine. That's just what all you editors write;—you can supply the theoretical, and the amateurs, I suppose, the artistic. They have elevated photography, don't you know, to a very high standard of art, for which we professionals ought to be so thankful. Wish they had elevated the prices while they were about it. "More price, less art," is my business motto; I do good work but don't call myself "artist,"—No, I assure you. Well, you want something practical, you say, and nothing about art. I see you don't take down all the æsthetic fellows say about posing and composition, or perhaps your subscribers are crying out, "Hold, enough!" Well, I shall not give you anything artistic; I buy my backgrounds from the dealers, and don't build up any of the poetic groupings,—genre pictures, as you call them. I am always consistent,—that is, make my figures and my grounds congruous: that's a degree in art I suppose. As I shall not or can not give you anything artistic, will you have something artless?

I have considerable reputation as a photographer of babies from knee-high to a bumble-bee up; though it is giving away my trade I shall not be stingy, as I have learned many a good practical hint from your magazine which some other generous fellow has given to the public free, gratis, for nothing.

My method with the little ones (recollect I am not a father, and therefore have no fatherly feeling towards them) is as follows:

The secret of success is in gaining their attention,—to get their little minds away from self-consciousness. I remember that one of the writers in your journal gives this as the key for successful portraiture. His language is flowery, and I suppose he is an amateur, but for all that there is a good deal of common sense running all through his paper—but I did not get my idea from him; I have photographed babies, some of whom are now grandmothers. To divorce the mind from self-consciousness is the way to succeed with babies of all ages. Your writer tells how to secure this desideratum in the grown folks; I shall tell you how to secure it with babies.

Suppose we have one of those crying, wiggling youngsters, about two or three

years old. You know how the minute they get in the chair the commotion begins ;—from sunshine to storm instantaneously. Have about you a number of noisical toys —not necessarily musical.

Begin at once to blow one of your penny trumpets. The result is a stare,—an inquisition from the little soul whence came that sound, a desire to investigate ; for all children, not idiots, are "newsy." Do not blow again on the trumpet, but ring immediately a bell. A new arrangement of the features take place. Follow them up with a chuckle, then a run down of the scale on a mouth organ. It is the quick succession of events which engages the mind of the child, and by the time you expend your energies on four or five differently sounding instruments, you will be rewarded with a smile ; then press the bulb and secure the impression. With larger children, who are intractable, I always have a lively conversation, sometimes a gentle dispute with them ; telling them I don't believe they know what they are talking about. Doubt the story of Jack the Giant-Killer. Now anyone bold enough to say that the story of the redoubtable Jack is a fabrication will receive the gentle anathemas of the little ones for his skepticism. The result is a most animated expression. Sometimes the telling of a fairy tale in a way that conjures up expectation is just the best way.

It requires tact to get along with children. I sometimes try similar dodges on grown-up babies who are so dreadfully self-conscious that they mar everything in the way of good expression.

You don't tell them fairy tales I hope ! I think I hear you say. Oh no, not exactly, but then I have a way of getting them out of themselves.

I first of all place on the upright towards which I direct them to look, not a black mark that can be shoved up and down, but an interesting picture, full of incident, about which they are sure to ask you something concerning the topic. I begin work, the story progresses, and when I am ready I direct attention to a certain figure or object in the picture which has direct reference to what I am talking about. Of course interest is excited ; the picture is at the right height on the pole for the eyes, and, moreover, the eyes, instead of being fixed staringly at one blank spot till they wink and water, can wander over a limited field without actually moving. This kink gives the means for securing the best expression possible. Some people tell me of course that I have taken them unfairly, and that the expression must be perfectly horrible. The proof is sent, and a good order follows ; not only from themselves but from their uncles, sisters and aunts.

The use of the spot on which to fix the eyes is an invention of the inquisition. It is a painful operation for a strong eye, and excruciating for tender eyes. In fact, I have known people to be almost put in a hypnotic state by gazing too long on a spot.

Now, as I wind up—or, as a photographer should say, cap my talk and put in the slide—I would like to know if you think this paper practical. If not, I shall add a string of formulas which neither I nor anybody else ever thought of trying, and I don't believe the men who send them to the magazine ever tried.

I shall, if you say so, point out some time how dreadfully absurd some of these formulas are, but I suppose you editors like them to fill up blank space. The best plan is to test them first, and not take them on the recommendation of some scientific amateur.

Yours truly,

JOHN WIEDERSEN.

ANOTHER NEW PHOTOGRAPHIC DEVELOPER.

The Pyro-Tartrate-Lithia-Developer.

From the St. Louis Photographer.

ABOUT a year ago, through the columns of this journal, I drew attention to the use of chloride of sodium as a valuable addition, when in proper quantity, to the usual pyrogallic acid developing fluid, as it retards the rapid change in the fluid without affecting much its activity as a reducing agent. But the color of the deposit forming the picture, when chloride of sodium is used, inclines more to a brownish shade than when the salt is omitted, and, though this does not injure the negative for printing, it is not quite so pleasing to the eye, and makes the image appear thinner than it really is.

Experiments in the same direction, continued from time to time since, have enabled me to produce and now to make known, for the benefit of all interested, a formula for a new pyrogallol developer that seems to obviate every objection that has been urged against pyrogallic acid, whilst retaining all its advantages, rendering it superior in all respects to hydroquinone, eikonogen, or ferrous oxalate.

The following is the formula, which I recommend to all engaged in photography to try :—Take of

Water (distilled)	1 fluid ounce.
Tartrate of sodium and potassium	25 grains.
Sulphite of sodium	25 grains.
Carbonate of lithium	1 grain.
Pyrogallol	2 grains.

Mix and dissolve in the order given.

It is best to put the above mentioned ingredients (or any multiple of them), except the pyrogallic acid, together at once into a well stoppered bottle, and shake till dissolved; then add the pyrogallol, stop the bottle, and again agitate gently till the solution is perfect.

This developer is nearly colorless at first, and will remain so an indefinite time if the air be excluded from it. After having been used several times, the color becomes like that of very pale sherry, and it is fluorescent. I have kept it for many weeks, using it at intervals, and with perfect satisfaction. It does not discolor or stain the gelatine film of the plate, nor cause it to "frill," and the high-lights of the negative are a good black, the detail and half-tones being well brought out.

After frequent use it gradually loses its developing power, but this can be renewed by adding a few grains of pyro or lithia carbonate, or both, as the case may require. The carbonate of lithium is strongly alkaline, but a different kind of alkalinity from sodium or potassium carbonates. It is not soluble in water to any large amount; two or three grains in an ounce of water will, however, easily dissolve. I have found one grain to each ounce of developer to be in general sufficient. Its cost, at present, is about the same as that of pyrogallol.

The *role* played by the tartrate of sodium and potassium (Rochelle salt) is to preserve the liquid from rapid oxidation in the air, to keep it pale in color, and to

prevent it staining the gelatine films or the fingers. Its action is complemental to that of the sulphite of sodium.

I recently tested this pyro-tartrate-lithia developer (which for brevity might be called "*pytali*," from the first two letters of each word) against "eikonogen" (the sodium salt of amido-naphthol-sulphonic acid), and got better results from the former. The test was made on halves of the same plate exposed and then cut in two. The "eikonogen" developer contained three times as much of that substance—*i.e.*, 6 grains to an ounce—as the "pytali" contained of pyro; and the former also had 15 grains of potass. carb., whilst the latter had but 1 grain of lithium carb. The former was freshly prepared, and the latter had been made five days and used once four days before. The half plate tried with *eikonogen* "frilled" so badly that the final washing had to be discontinued too soon, in order to save the picture; whilst the other half plate tried with *pytali* showed no signs of frilling when soaked the full time. The plate used was one of Carbutt's Eclipse, No. 27.

The image came out well in both cases, and in about the same time, but I thought the eikonogen negative was inferior to the other in grain and delicacy.

JNO. VANSANT.

U. S. Marine Hospital, Mobile, Ala., Nov. 13, 1889.

PLATINOTYPE PRINTING.

(*Hastings & St. Leonards Photographic Society.*)

A MEETING was held at the Brassey Institute, on Monday, the 14th inst. The proceedings were commenced by the Chairman (Mr. W. Shuter) receiving the report of the judges appointed to judge the results of the society's summer excursions. There being only a few exhibitors, the original idea of making each excursion a competition was given up, and only two awards made, viz., to A. Brooker (Hon. Secretary), for the best photograph sent in, and J. Downsborough, for the best collection of photographs.

Mr. Jones, the demonstrator from the Platinotype Company, was then called upon, and read the following paper:

In demonstrating to you the hot bath platinotype process this evening, I should like to make a few introductory remarks.

A great number of amateur photographers appear to be afraid to work this process; probably being led away with the idea that none but exceptionally good negatives can be printed from successfully. This might have been the case years ago, when the process first came out; but, thanks to Mr. Willis (the inventor), the process has been improved, and a tolerably good negative will print as well in platinotype as in any other process, but select negatives rather intense and full of gradation should you want very brilliant prints.

The paper for the hot bath process is sensitized with platinum and iron. On receiving the paper from the Company (which is sent out in plain tins with calcium), it should be transferred to the special calcium tubes with india rubber bands over

the joints, making the tube perfectly air-tight. The paper will keep from three to six months in these tubes if the calcium be kept perfectly dry. A safe plan is to take the calcium and place it in an oven for a quarter of an hour once a fortnight. The printing is conducted in an ordinary printing frame, with india rubber pads to keep the paper perfectly dry, and to insure contact.

The sensitized surface, before exposure to light, is a lemon-yellow color. During exposure the parts affected by light become of a pale grayish-brown color, and finally, if the negative be quite vigorous, of a dull orange tint under those parts of the negative which present *almost* clear glass.

When the last change has occurred it indicates that the iron salt has been almost completely reduced, and that further action of the light produces no more visible effect on such parts. When printing from a negative having moderately strong contrasts it is frequently found that the deepest shadows of the print are of this orange tint, and are different and lighter in color than the parts rather less exposed to light.

Parts in which this change has taken place are said to be "solarized." Soft printing negatives not permitting sufficient action of light in the shadows, do not produce this effect, unless the proofs are much over-printed.

Prints from hard negatives are liable to show, when deeply printed, *black* at these parts when developed. Such cases demand a hot and prolonged development. The most suitable kind of negative, when brilliancy is desired, is one intense and full of gradation.

Generally a little "solarization" is desirable in the deepest shadows of the print; but upon this point no precise rule can be given, all depending upon whether a brilliant or soft result is required.

The correct exposure—about one-third of that required with silver printing—is ascertained by inspection of the paper in a rather weak white light in the usual manner. A little experience will enable the exposure to be determined very accurately.

When examining the prints in the printing frames, care should be taken not to expose them unduly to the light; for it should be observed that the degradation of the whites of the paper due to slight action of the light, is not visible until after development. As to the amount of detail visible, all depends upon the nature of the negative and the eye of the observer. It is found that some can detect differences not observable by others; for this and for other reasons no rule can be laid down.

It should be noted that paper which has been kept some time tends to render half-tone more than when fresh; hence a too hard negative would print best with "kept paper," provided, of course, that the latter be also in good order.

As soon as the exposure of each print is complete, it should be placed in a calcium tube containing the dry preparation of chloride of calcium, to preserve it from moisture, until it is developed, care being taken to avoid all possibility of contact between the paper and the calcium, which would produce white spots on the prints.

The developer is made by dissolving 130 grains of the oxalate of potash in each ounce of water. It is advisable to use hot water for making the solution, of which a large quantity may be made up; it will keep indefinitely. Sixteen ounces (1 lb.) of the oxalate of potash to 54 ounces of water is sufficiently accurate. A

weaker solution must not be used. It is very desirable always to have at hand some unused solution, since, in the event of inferior prints being made, a new bath may at once be tried.

The bath must not have an acid re-action. If it be found to be acid, add a very little carbonate of potassium until slightly alkaline to test paper.

Development should be conducted in a feeble white light or by gas light.

It may be proceeded with immediately after the print is exposed, or, more conveniently, at the end of the day's printing, when the various prints from the negatives may be sorted and heated as appearance may dictate.

The solution is conveniently contained in a flat-bottomed dish of enameled iron, supported on a small circular gas-stove; this forms the best means for supplying the heat.

If no gas is obtainable, a spirit lamp may be used for the smallest dish, but the larger dishes require a paraffine stove.

Troughs for large prints are fitted with a tube gas-burner.

The development is effected by floating the printed surface of the paper for not less than five or six seconds upon the "developing solution." To avoid air-bubbles, lay one edge of the print upon the solution near the left-hand end of the dish; then, with a sliding motion to the right, lower the print, with an even movement, without stoppage, until it is entirely in contact with the liquid, where it must remain until complete action has taken place. Then raise; if any air-bubbles appear re-immerse.

A good plan is to place the prints, after removal from the printing frames, in a calcium tube with their printed surfaces outwards. In a short time the prints will receive and retain their curvature sufficiently for the developing operation.

To develop, take the print in the right hand (its printed surface being downwards), lay the left-hand edge on the developer, and then, slowly and continuously, lower the right hand until the whole print is floating; the great point is to well preserve, and if possible increase, the curvature of the paper as it nears the liquid. A temperature varying from 130 degrees to 160 degrees Fahrenheit may be considered the standard temperature for the developer, though higher and lower temperatures may be used on occasion. To test the temperature a chemical thermometer must be used. There is very great latitude (from 100 degrees to 180 degrees Fahrenheit and upwards) possible in the temperature of the developing solution for the "black" prints. Over-exposed prints may be frequently saved by using a low temperature and weak developer, and those under-exposed by using a high one. The print should not be raised for examination during development, nor be taken off the bath too soon, otherwise brilliant and "juicy" prints will not be produced. Such action produces practically cool development. The bottom of the developing dish should be covered with the developing solution to the depth of at least one half of an inch, and the solution be occasionally stirred.

After the batch of prints has been developed, the solution should be put without filtering into a bottle for future use; it should not be exposed for any length of time to a strong light, but should be kept in a cupboard.

When the next occasion occurs for the development of prints, the solution probably will be found to be nearly clear, but, of course, tinted by previous use. If this clear solution be not sufficient for use, add to it some of the fresh solution of the

potassic oxalate. It is, indeed, a safe plan always to keep the "bath solution" up to its original bulk by this means.

It must not be supposed, however, that a little suspended matter in the bath is of any consequence. The prints after development should be placed in a porcelain dish, face downwards in the acid bath, which is made by mixing one ounce of hydrochloric acid with sixty of water; they should have three such baths of ten minutes each, and should be moved occasionally to prevent one print adhering to another and so stopping action of acid.

The prints should not communicate to the last acid bath the slightest tinge of color. If the bath, after the prints have been washed in it, does not remain as colorless as water, the prints should be placed in another acid bath. The object of this washing in dilute acid is to remove all traces of iron salts from the paper before it is passed into the plain water.

It is obvious that if there be the slightest trace of color observable in a large bulk of the last acid bath there will be a very large appreciable quantity of iron salts present; if so, there must be a proportionate quantity also contained in the body of the print. This plain water will not remove; the use of the washing in plain water is to remove the acid.

The prints must not be placed in plain water on leaving the developer; if this is done the prints turn yellow.

After the prints have been through the acid baths, they should be well washed in two or three changes of water for about a quarter of an hour each; they are then finished. In conclusion, I would remind you that there is no license required for working this process, and I will undertake to say that any one who has successfully worked the process will never return to the tedious method of silver printing.

The plate sunk mounts are the most suitable, and the best mountant is plain starch. It must be plain to every one that platinotype is superseding all the photograph printing processes, and to prove this fact one has only to look around the exhibitions and see the great number of prints which are done in this process compared with others.

The prints are absolutely permanent, there being no known acid which will affect platinum. Thus, however much exposed to light and air, nothing can destroy the purity of the picture. Dirt may discolor it, but if so it can be bleached with a solution of chlorine which will render it as fresh as ever.

F. E. JONES.

THE EIKONOGEN DEVELOPER.

(*Photographie mit Bromsilber Gelatin.* By David and Charles Scolik.)

THIS new claimant for preëminence as a developing agent has with astonishing quickness forced itself to the notice of the photographer.

It has indeed certain virtues, but these are more than counterbalanced by its shortcomings, and it is not likely that the time-honored pyro, the ferrous oxalate, or even hydroquinone, will be called upon to resign in its favor.

By reason of its energetic powers of reduction, as well as the fineness of the deposit it causes upon the film of the negative, it has won praise from the enthusiastic amateur who delights altogether in instantaneous exposures. Much shorter timed plates yield better results with eikonogen developer than with the other reducing agents. It brings out the fine detail much better.

For portraiture it is not so suitable, inasmuch as the blue tones it gives to the negative interfere with the printing. The shadows are too transparent, and the fine gradations are lost in the copy, although the negative itself may look perfect.

This transparency of the shadows is also an objection to hydroquinone.

For Separate Solutions.

(1.) 200 grammes sulphite of soda are dissolved in 3 litres of distilled water, to which is added 50 grammes eikonogen.

(2.) 150 grammes crystallized carbonate of soda, dissolved in 1 litre distilled water.

For use, take 3 parts of No. 1 and 1 part of No. 2.

For Mixed Solution.

200 grammes sulphite soda, 150 grammes carbonate of soda (cryst.), are first dissolved in 4 litres of distilled water (cold), and then 50 grammes of eikonogen as a dry powder.

This solution is employed directly as a developer, without the addition of water.

For very short timed exposures a preliminary bath should be used :—

Hyposulphite soda	1 gramme.
Distilled water	2 litres.
Bi-chloride of mercury solution 1–10	15 drops.

The plate is bathed in this solution one minute, and developed without washing.

After development the plate is washed off and placed in an alum bath (50 grammes alum to 1 litre of water) for one minute, then rinsed off and fixed.

For short exposures treated in the above way, eikonogen is very effective. The same effect is produced two or three times as quickly as with hydroquinone, without falling behind the fineness obtained by the latter.

For longer exposures, a less amount of eikonogen should be used.

After many trials, we have found the following the best :—

Solution 1.

Sulphite soda (cryst.)	40 grammes.
Eikonogen	5 grammes.
Water	600 ccm.

Solution 2.

Carbonate of potassa	40 grammes.
Carbonate of soda	40 grammes.
Water	600 ccm.

For use take equal parts.

For over exposures bromide of potassium is employed, or the developer weakened with two or three times its bulk of water, or old developer can be used at first, and when the details have come out, the plate can be re-developed with fresh solution. In this, bright, clear negatives may be obtained, with fine gradations.

We recommend the use of the separate solutions, the mixing being made only when wanted for immediate use.

The eikonogen developer is also applicable to the development of bromide paper. An old developer here may be employed with the best results, and beautiful velvety tones, pure whites, and a variety of rich half-tones secured.

Immediately after the development of the bromide print, it should be placed in water, with three per cent. of acetic acid,—then washed and dried.

Fresh developer works too energetically, and attacks the whites even when the exposure has been short, and a flat, tame picture is the result.

Those who have been accustomed to develop bromides with oxalate developer will find no difficulty in using eikonogen, and will be repaid by the clear, beautiful results obtained.

ART, SCIENCE, AND BUSINESS.

IT has been complained that photographers in their profession have given more time and study to the scientific than to the art side of the subject. The complaint may be in a measure justifiable, and yet with a moderate amount of thought, it may be proved that for the future of photography this is not altogether unwise. It seems that such constant application to the scientific side has reduced, and is reducing, photography to an almost mechanical operation, by this means giving a man who has failed in everything else an opportunity, not exactly of making a livelihood, but of failing in this also. Through this simplifying action of science the unscientific amateur who has dabbled in everything but photography, receives a fresh subject for dabbling, and, of course, dabbles. In other words, the result is simply that, by giving outsiders the benefit of hard earned experience, the at one time select photographer has, to all appearances, ruined his business, and lowered the standard of his art. But there is another more important result, that of dividing photographers into two distinct classes. Though photography as a profession may have many grades, there must naturally exist a wide distinction between the purely mechanical and the intelligent and educated application of the mechanical. It might be said that, did our "art-loving public" justify its name, the purely mechanical man would prefer a ward in the workhouse to starvation in his studio; but our "art-loving public" does not justify its name, and in consequence, the purely mechanical man continues, not to thrive, but to prevent his more deserving relation from doing so.

To prove the truth of this, I wish to draw a comparison, but before doing so may mention incidentally that I speak of the distinction of *classes*, and therefore generally, and not individually. A fair estimate of a photographer's class may be taken by his shop window, and that irrespective of the actual work contained therein. The arrangement of the window, the advertisement of the name and position—generally artist and photographer—of the owner in every possible space, even the number of specimens shown, all go to prove pretty nearly the one class, the other class being conspicuous by simplicity and total absence of display. There is a saying that "Advertisement is to business what steam is to machinery," and so on. This may be true enough, but does not necessitate a page advertisement of "Good morning! Have you been photographed at So and so's?" Neither does it necessitate posters, circulars, and what not. Advertising requires money; time means money. Turn money into time, and spend that time in the greater perfection of work, the truest and best advertisement a photographer can have.

A better estimate of the two classes can be had by looking at the mounts sent out by photographers. A highly enameled surface, richly embroidered and bedecked with precious metals, emblazoned with heraldic devices, and a bold and flowing signature in every available space—here is the one; and the other shows but a good, stout, plain card, a very small and unpretentious name and address at the bottom, and possibly the same on the other side. A small distinction this, but one that says plainly, vulgarity or good taste; ostentation or simplicity. The best estimate, of course, is the actual work, on the comparison of which columns might be written. The corkscrewed, heavenward-looking pose, and the natural, unstrained pose; the fancy lighting and the effective lighting; the excess of accessories, and accessories as accessories only; the not dim but distinct vista of noble columns, of palaces, and every other impossibility, and the plain or shaded background. Photographers would do well to take the sense of the following quotation: "There is perfection of the hedgerow and cottage as well as of the forest and palace; and more ideality in a great artist's selection and treatment of road-side weeds and brook-worn pebbles than in all the struggling caricature of the meaner mind, which heaps its foreground with colossal columns, and heaves impossible mountains into the encumbered sky."

The matter may be summed up in a few words. Science has simplified; simplification has produced excessive competition, excessive competition has reduced prices and the standard of work at the same time. The probable result is that, as cutting prices will be continued, the standard of work will become more degenerate. This will necessitate, if it has not already, the lowering of wages, and bad pay and bad work go together. Our art-loving public will then have sufficient penetration to see that, after all, the photographer who has stuck to his prices from a love of his art and a conscientious wish to keep and improve its standing, is, perhaps, the real "artist and photographer;" the finale, of course, being the exit of the degenerate photographer amid fire and brimstone, "unwept, unhonored, and unsung," and the entrance of the Photographic Millennium.

According to precedent, however, millenniums are rather slow in their movements, and require a little acceleration to bring them in sight in reasonable time. Doubtless, the best form of acceleration possible would be to allow those photographers who wish to cut their own throats to do so. The true lover of the art should

create as wide a distinction as possible between his and the aforesaid gentleman's work, by doing his best work at a good price. It goes without saying that good work cannot be done at a low price. If cartes-de-visite are reduced from 10s. to 5s. a dozen, not only is the profit far less, but double the amount of work must be done to equal the original cash receipts. Where, then, can the necessary time come from to keep up the standard of the work? One important fact seems to have been entirely overlooked. Photographers complain of the cheapness of the age, but it may be taken for granted that those customers who go to a photographer for the sake of cheapness, prove themselves plainly to be those out of whom little or no profit can be made.—*Photographic News.* H. COLEBROOK.

THE FADING OF SILVER PRINTS.

IN an article in the *Photographic News* of the 1st instant, Mr. C. Brangwin Barnes announced that he had discovered the cause of the fading of silver prints to be albumen. The proposition that albumen is a cause of fading has often been made before, but with the announcement that a discovery has been made, some proofs of a nature that will bear scientific investigation are naturally expected. No such proofs, however, have been produced, and as it is sometimes as useful to assist in exploding old fallacies as in promulgating new discoveries, it may be worth while to discuss the question with the help of what argument can be drawn from past experience and observation. The wide-spread impression that albumen is somehow the cause of fading of silver prints appears principally to rest upon the foundation that silver prints generally fade, and that silver prints are generally printed upon albumenized paper. Mr. Barnes does not carry the evidence much farther; his opinion, which I submit does not amount to a discovery, being apparently formed from his own observations of the fading of certain photographs, and some of these observations point in the opposite direction, as showing the preservation of albumen prints that have been in existence for more than thirty years.

The argument by which the permanence of these thirty year old prints is made to support the contention that albumen is the cause of fading of silver prints will not, I submit, hold good. It is stated that the albumen paper of thirty years ago was not as that of to-day, and that the albumen was then only employed to avoid the grain of the paper, and was used very sparingly. These propositions cannot, I think, be accepted as proved. My own remembrance is to the effect that paper was then very nearly as highly albumenized as it is at the present. In Hardwich's "Photographic Chemistry," published in that year, the only two formulæ given for albumenizing paper contain: one, three parts of albumen to one of water, and the other, pure albumen with the chloride beaten up in it, and no added water at all. Supposing, however, the three-fourths albumen solution to have been used, that is still a proportion which cannot be called a very sparing one, and in any case, if the essential cause of fading is albumen, this cause might be expected to operate wherever albubumen is present in sufficient quantity to give its name and character to the paper.

Mr. Barnes's statement that he has never yet seen a faded print upon salted paper is rather surprising. Salted paper has been so little used of late years, that one may very well not have seen any at all for some time past; but I should think that all those photographers whose experience goes back to the times when salted paper was in common use could recollect many instances of fading in these productions, perhaps nearly as many in proportion to the total number of salted prints made as they could of faded albumen prints of that time. I say of that time because, before cartes-de-visite became general, the production of paper prints was so limited that they probably received more thorough washing, in the shape of several turnings over by hand, than was afterwards the case. If, however, the proportion of faded to durable prints should prove to be somewhat lower with salted than with albumenized paper, such a circumstance would not justify the sweeping conclusion that albumen is the cause of the fading of silver prints. Toning proceeds much more readily on salted than on albumen paper, and the plain prints are, therefore, more likely to receive what protection is derived from a considerable substitution of gold for silver. Again, some photographers—notably Hannah and Kent, of Brighton—were in the habit of finishing the washing of salted paper prints with boiling water, a proceeding which not only ensured a more perfect removal of the hypo-sulphite of soda, but of the drying material of the paper. Albumen prints, it was found, would not endure this treatment without too much loss of tone. As to the suggestion that a print of ten or twelve years old, on highly glazed albumen paper, is not to be met with, it may be said in reply that prints of that character, and of considerably greater age, have often been produced at meetings of societies—prints which were in a perfectly good condition, showing no sign of that deterioration of the albumen itself to which Mr. Barnes refers.

The unfaded albumen prints just mentioned have mostly not been mounted ones, and this brings us to another consideration, namely, that mounting might, with at least as much justice as albumen, be set down as the cause of fading of silver prints. The instances in which unmounted prints have been found to remain unchanged, whilst mounted ones have faded badly, are so numerous as to leave no doubt that some mounting is, at all events, a cause of fading. Further striking instances of this have been found in photographs which have been mounted at the edges only, and in which these edges have faded badly, whilst the rest of the picture remained but little altered.

As an alternative proposition to the one that albumen is the cause of fading, it was once suggested that the fading was due, not to the albumen itself, but to gelatine which had been added to the albumen bath as a sort of adulterant. A circumstance which seems to give some color to the charge as against gelatine or other sizing materials, used probably in the paper, and not with the albumen, is that prints kept long in the washing water are apt to show weakness, as if some kind of fading had already commenced. In many houses it has been noticed that the prints taken out of the water on Monday mornings are often rather inferior to those that have only had one night's washing. Gelatine, we know, is apt to decompose when left in water for a couple of days, but with coagulated albumen there is, I believe, no proof of such a condition being set up.

As a further argument against picking out albumen as the cause of fading, it may be noticed that in the *Photographic News* recently Dr. H. W. Vogel says that it is well known that aristo prints—which contain no albumen—are not more permanent than other silver prints.

It appears, therefore, that not only is there no proof that albumen is the cause of the fading of silver prints, but that the facts point to some other condition or conditions than that of its presence as the real cause. What these conditions are may some day be laid down, but a useful preliminary to their discovery is the abandonment of any indefensible opinions that may have been entertained.

W. E. DEBENHAM, *in Photographic News.*

BRILLIANT PRINTS.

THE very first question the amateur asks on seeing a brilliant silver print is, What is the toning bath? As if the only conditions necessary for success depended upon the quality of the toning solution employed. But there are other circumstances which control the production of good work, aside from the toning, important as it is. First of all, the negative must be good; not necessarily one possessed of vigorous contrast, but one having a rich gradation of tones, and free from fog. Many a negative which looks weak to the eye is capable of yielding superb results if properly handled in the printing, but many a print is marred before it gets to the toning bath, so that it is vain to expect good results with careless printing even though the most approved formula in toning be followed.

In questioning amateurs about their failures I always begin by asking them about the nature of the printing bath; generally they are uncertain whether it is alkaline or acid. Very often the silver solution is acid, and of course nothing but foxy prints can be expected. I recommend at once attention to the printing to see that it is just slightly alkaline, never decidedly, which is as bad as acidity.

After rectifying the bath I direct attention to the printing itself. Over or under printing cannot be remedied by the best toning process. The eye, or rather the judgment, must be trained to an appreciation of the proper degree of sunning necessary to accord with the toning bath employed.

I sometimes think that the prints after removal from the frame are subjected to too much washing. I do not mean that the prints should not be washed, but that they should not be allowed to soak so long time in the water as to extract all the silver from them, and so leave nothing for the gold to lay hold upon.

I place my prints in water acidulated with a little acetic acid, turning them over once, rocking the dish to keep them in motion. This water I save for the silver it contains, then I give them a good washing under the tap, till the water is clear from milkiness.

The acetic acid reddens the prints so that the change of color in toning can be better observed.

There are various methods for securing brown, sepia, black, and blue tones. If a rich chestnut brown be required, but slight toning is necessary. Black and blue tones require longer action.

The peculiar tone desired depends a good deal on the amount of chloride present on the paper, as well as upon its quality.

After I have given the advice above detailed I then tell the inquiring photographer the particular bath I use in toning, but always add that there are other baths which will work equally well, and that success depends more on the manipulation than upon the peculiar virtues of the toning bath.

The following toning baths will be found to work well with freshly prepared silvered paper:

15 grains	Chloride of Gold.
18 ounces	Water.

Add

Borax	1 oz.
Salt	1 oz.

This should be mixed a day before using, and forms the stock solution. For toning take one part to three of water. The operation is best performed if the solution is kept slightly warm. Keep the prints in constant motion, and as fast as toned remove to a dish of clean water.

Wash well before fixing in clean water, and before putting the prints in the hypo bath immerse for five minutes in salt and water, the object of which is to prevent blisters on the albumen. A little alcohol, say ½ ounce to 32 ounces of hypo solution, is also a preventive of blisters.

JOHN FLEMMING.

TORONTO AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE first weekly meeting of the association, for the season of 1889-90, was held in their rooms, College of Physicians and Surgeons, on Monday evening, November 18th, at 8 P. M. The president, Mr. W. B. McMurrich, in the chair.

The president, in his opening address, thanked the large numbers present for coming out in such unpropitious weather, and heartily welcomed those who had accepted the invitation extended to them by the officers of the association, and hoped they would be repaid to some extent for the interest they had shown in amateur photography. He also informed them of the intention of the association to give practical demonstrations during the winter, in all branches of the art. Mr. Neilson had kindly consented to give the first of the series, taking for his subject, "The Making of Lantern Slides." The president then introduced Mr. Neilson, who gave a short address on the Lantern; stating that it was not a modern invention, as a great many supposed, but had been in use some 200 years ago. Before proceeding to the actual Lantern Slide making, he produced for inspection a simple but unique apparatus designed by himself, for the reduction of negatives of any dimensions to the size of lantern plates, and which could be used for artificial light or by day. The former process he did not recommend, owing to the extreme difficulty of getting the negative properly illuminated by lamp or lantern, as he considered it would be necessary to stop down the lens to get a fairly good reduction, and that would necessitate an exposure of at least one-half to three-fourths of an hour. The process of reduction by day was much more simple and easy, as it would take only a few seconds' exposure on an ordinarily bright day to get a good slide, consequently he advocated the latter mode as being by far the more satisfactory of the two. Contact printing was the next best method, providing the negative was not bigger than one-fourth plate. Mr. Neilson here gave a practical demonstration; taking a very dense negative he gave it thirty seconds' exposure, about fifteen inches distance from an ordinary gas jet, and developing with the well-known ferrous-oxalate solution, the slide turning out to be an excellent one. Mr. Neilson then explained how they were matted and bound, finishing some he had brought with him for that purpose.

The next feature of the evening's entertainment was a Lantern Slide Exhibition, by the Secretary, who put through a series of views descriptive of the recent outing of the Association on Thanksgiving Day, which proved a source of amusement to all present.

The above views were taken with Detective cameras, manipulated by Messrs. H. Neilson, J. G. Ramsay and E. H. Walsh. After this a collection of excellent landscape and marine views, groups, etc., were put through. These last were taken with cameras by Hon. A. M. Ross, W. B. McMurrich, George McMurrich, and a few other members. These subjects had been carefully chosen, as some of them were by far the best slides shown this year.

This ended one of the most enjoyable evenings yet spent in the rooms, and it is to be hoped it is only a precursor of what is to follow.

E. HAVELOCK WALSH,
Secretary and *Treasurer.*

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the Society was held on Wednesday evening, December 4th, 1889, with the President, Mr. Frederick Graff, in the chair.

The Committee on Lantern Slides reported that at the November Conversation Meeting, the first set of slides from the American Interchange for 1889-90 was shown, being those of the Society of Amateur Photographers of New York. About seventy-five slides were shown, the general standard being high, and showing an improvement over last year. Slides were also brought for exhibition by Messrs. George B. Wood, Dr. C. L. Mitchell, F. H. Rosengarten and others.

The Committee on Membership reported the election to active membership of Mr. George M. Taylor and John Kearsley Mitchell.

The Executive Committee announced the opening of the exhibition of pictures contributed by members of the Society, from which the four "Honor Pictures" for the year would be selected. The pictures were hung on the walls of the meeting-room, where they would remain until the annual meeting in January. During the month members would deposit votes designating their choice of the pictures in a box prepared for the purpose, and the result would be announced at the January meeting.

Nominations for officers and committees for 1890 were made.

A paper was read by Mr. Theodore H. Lüders, "On Development with Pyrogallic Acid in connection with Ammonia in Vapor."

Mr. Morris Earle showed some novelties in photographic apparatus, which he had collected during a trip to England and the Paris Exhibition. Among them were some trays made of thick waterproof paper for developing, and other processes in photography. When not in use, by loosening metal clips at the corners the trays could be opened out into flat sheets, rendering them extremely portable. A small and exceedingly portable achromatic focusing glass made by R. & J. Beck was shown, also a neat leather case in which to keep or carry a lens with safety. Mr. Earle described a carrying case for film negatives to be attached to the back of a camera after the manner of a roll holder. The position of the films was changed by inserting the hand through a bag or sleeve. He also described a Panoramic View Camera which he had seen in Paris. A film or paper negative was used, being bent into a semicircle with the lens in the centre. By a lever on top of the camera the lens could be revolved so as to cover different portions of the plate successfully. The light was admitted to the lens (which was of fixed focus) through a diaphragm in front in the form of a perpendicular slit, the opening revolving with the lens as it was turned. A unique feature possessed by the camera was the fact that if in one portion of the view dark objects predominated, requiring long exposure, the lens could be allowed to cover that portion of the view for a greater time, and less exposure be given to the brighter parts of the view, simply by properly manipulating the lever attached to the lens.

Prints from negatives made by the camera had been seen by Mr. Rau, Dr. Mitchell and others, who corroborated Mr. Earle's account of their remarkable qualities.

Mr. John G. Bullock called attention to the late explosion of flash-powder in this city, with its terrible result in the death of three persons. The details were no doubt familiar to the members present, but as the photographic world at large may not have heard of it, he thought it right that the published minutes of the Society should caution all to look with distrust upon flash-powders of a yellow color, and if they prove upon examination to contain picric acid along with powdered magnesium to consider them highly dangerous. Picric acid upon standing in mixture with powdered magnesium for a length of time is supposed to form picrate of magnesium, a highly unstable combination more dangerous than dynamite. A person finding a vial of such flash-powder in his possession had best dispose of it at once, but with great care. He is advised against pouring water upon it or burning it, but rather to throw the whole vial into a river or down some gorge where it would be scattered without doing harm. The very act of removing the cork from the bottle might be attended with serious results. The danger of picric acid flash-powders increases with age.

Dr. Mitchell fully agreed with Mr. Bullock, and considered all flash-powders, except those composed of pure magnesium, more or less dangerous, differing only in degree. Magnesium has a tendency to absorb moisture, in which state it readily combines with picric acid forming the dangerous picrate of magnesium. Even a single ounce of such powder would be exceedingly dangerous.

On motion of Mr. Wood, Mr. Bullock and Dr. Mitchell were requested to prepare a paper for the next meeting on the subject of flash-powders.

Mr. Rosengarten called attention to a method of preparing ground glass for focusing screens by the use of hydro-fluoric acid in combination with carbonate of soda.

Dr. Wallace spoke of the use of a solution of plain boiled starch spread upon a plate of glass, and allowed to dry, thus forming a very fine surface for a focusing screen.

Mr. Wood described a method of focusing without the use of any screen. If the position to be occupied by the plate is determined by a metal strip located in the usual position of the ground glass, by placing a focusing glass against this strip it will show (over a limited area, of course) the image usually projected on the screen and a proper focus can thus be readily obtained. A piece of plain glass can also be used in this manner as a support against which to place the focusing glass.

Dr. Mitchell asked the experience of members in regard to films, stating that he had found some rolls to be very good, and others not. He had noticed markings like long transparent lines as though scratched with a needle.

Mr. Luders suggested that they may have been damaged in unpacking.

Mr. Wood stated that he had lately returned from a trip of over a thousand miles on which he had used films, and his feeling was that hereafter he preferred the weight of glass to the uncertainty of films. He thought nothing had yet been discovered to equal the perfect surface of glass, and the certainty of its results.

Adjourned.

ROBERT S. REDFIELD, *Secretary.*

DEVELOPMENT BY ICONOGEN.*

From L'Amateur Photographe.

THE iconogen developer has claimed most attention for some time past, and the advantages it possesses over other developing agents are so real that I have little doubt that before long it will be the principal substance employed until the price of pyrocatechin shall have been so reduced as to render the use of that substance practicable.

I have not found the formula given by the inventor satisfactory; iconogen in the proportion he recommends for instantaneous work requires much time for its solution, and as there might at times be no developer at hand for instantaneous exposure, unavoidable delays would occur in the preparation of solutions.

The proportions I use are as follows:

I.—Distilled water	600 c. c.
Sodium sulphite	40 grammes.
Iconogen	20 grammes.
II.—Distilled water	1000 c. c.
Sodium carbonate	60 grammes.
Sodium sulphite	40 grammes.
III.—Distilled water	100 c. c.
Caustic potash	50 grammes.

For time exposures I take three parts of No. I to five parts of No. II. For instantaneous exposure, fifty parts of No. I to one and a-half or two parts of No. III. The only difference between my formulæ and those of the inventor is the employment of caustic potash, so that the quantity of alkali may be graded to the exposure of the plate.

Besides, I believe that plates will not frill in the iconogen bath, even if they receive light (this is the great advantage of pyrocatechin), but on this point I must report my experiments.

PAUL DUPONT.

* The most correct spelling of the word in English. There is no more reason to spell it "eiko" than there is to spell the word iconoclast in the same manner.

AMERICAN JOURNAL OF PHOTOGRAPHY

With the present number completes the first decade. Ten years ago it was launched forth an unpretentious venture to make its place amongst the full-rigged and well-manned crafts which then dominated the sea of photographic literature (I suppose field is a better word to use here than sea, only our magazine as a ship could not prove that it was making progress over the land—we leave that to the locomotive in our literature). We rejoice that our magazine has not been swamped nor driven into quicksands by injudicious management, but that it has kept right on; and year by year has freighted itself with richer commodities, which have gained for it many a new port of entry, so now it sails to India, China, Egypt, Australia, Alaska, Cape of Good Hope; visits every state in the Union,—the latest born and those still unborn; almost every state of South America, the new republic of Brazil, and Mexico, and the islands of the sea. Throughout Europe it finds welcome, and in every principal city of Great Britain.

We turn to our first subscription list, which we confess was small, but there we find a few names who have received the magazine from the first number until now. They seem like a nucleus around which our present ever-increasing list has congregated. It is this substantial growth from month to month which encourages us to go on like the Sailors of Jason, adding new timbers to our argosy, and removing such as have become old and useless. In another month our Journal will appear full-rigged and heavy laden with photographic wealth for its subscribers bound on its eleventh voyage, and we hope that all who have not sent in the small freight charges of one dollar for cargo for twelve months will do so at once.

NOTES ON USE OF CAMERA.

Of all the contrivances about a camera none perhaps is so often misused as the swing back. Many a time its employment would have been more honored in the breach than in the observance. To have a swing back means that it must be used on all occasions, whether the taking of the building demands its employment or not. What is of more importance than tilting the camera and applying the swing back, is keeping the camera level wherever possible. Don't tilt and use the swing back every time. Very often a better view of a high building can be had by leveling the camera at the building from a window at a suitable height opposite. Determination of the proper lens is of the greatest importance in architectural views;—what focal length will best secure the object in proper proportion. It is well to use a wide-angle lens which covers a plate the next size above. For instance, if the view is to be on a 6½x8½ plate use a lens for 8x10. With such a lens we can raise the front without straining. A swing back, however, is like a Texas revolver,—rarely needed, but when that rare time comes, it is needed badly.

LITERARY AND BUSINESS NOTES.

LIESEGANG'S PHOTOGRAPHIC ALMANAC AND CALENDAR for 1890 is the first of the photographic annuals to greet us, being in advance even of our own American publications.

The almanac contains many good papers and numerous photographic formulas together with some valuable tables. The frontispiece is a most excellent print in ordinary ink, representing a view of Flensburg Harbor, by William Dressen. There are also a number of excellent small illustrations. Published by Ed. Liesegang, Dusseldorf, of Germany.

VOLUME two of the German Photographic Library, published at Weimar, by K. Schwier, is entitled Uber die Bedeutaug and Verwendung des Magnesium Lichtes in der Photographie, by Dr. Max Müller, professor in the Technical High School at Brunswick.

It contains two full page illustrations, one of which represents an old gentleman reading the newspaper, and is remarkable for the life-like representation. The expression on the face is perfect, and could only have been caught at a moment when wholly unconscious, and it is just herein that the magnesium light transcends all else in efficacy. No doubt the picture was taken at night, as the surroundings seem to strengthen the supposition. The other picture is a representation of the interior of a cave. The stalactites are shown with all their characteristic beauty. The photography of dark interiors, caves, and mines, has only become practicable since the introduction of the new illuminator, and we look for many wonderful results to follow its employment in such places as are otherwise wholly inaccessible. This work of Dr. Müller's is a valuable contribution to the literature of the subject and as it is full of practical suggestions and bears evidence on every page of the experience of the writer, its reading must be followed with advantage.

A CARD.—Mr. Morris Earle, of the late firm of Morris Earle & Co., 1016 Chestnut street, desires to inform his friends and former customers that he is now a member of the firm of Williams Brown & Earle, 33, 35, and 39 South Tenth St., corner of Chestnut. The new firm has been appointed Sole Agents in the United States for Messrs. R. & J. Beck, of London, the well-known manufacturers of Microscopes, and Autograph Photographic Lenses. In addition to the unexcelled manufactures of the latter firm, there will be a complete stock of all the best goods of foreign or domestic manufacture pertaining to the business. Mr. Earle will give his personal attention to the photographic supplies, photographic printing, and microscopical branches of the business, and solicits for the new firm a continuance of the favors extended in the past.

WILLIAMS, BROWN & EARLE.

Mathematical, Optical, Photographic and Microscopical Supplies, Nos. 33, 35, and 39 South Tenth street, corner of Chestnut street, Philadelphia, Pa.

THE Toronto Amateur Photographic Association, which holds its meetings, in the College of Physicians and Surgeons, has been in operation for a year, and is, we are pleased to say, in a very prosperous condition. Both ladies and gentlemen are admitted to the membership. The Society has a commodious dark room fitted up regardless of cost, and supplied with all modern appliances, having, among other things, a sink eight feet long, with a sufficient number of taps to allow five members to develope at the same time, also an automatic washing-tank, and a fine stock of photographic chemicals. The library is a good-sized, comfortable, well-lighted room, heated by steam, and on the table are the usual list of photographic magazines.

The following are Officers elected at the last annual meeting for 1889-90:

President, W. Barclay McMurrich; Vice-President, F. D. Manchee; Secretary and Treasurer, E. Havelock Walsh; Executive Committee, Dr. Ellis, G. S. C. Bethune, George McMurrich, Rupert Muntz, Hugh Neilson, T. Langton, D. W. Cameron, A. E. Trow.

TRAITÉ ENCYCLOPÉDIQUE DE PHOTOGRAPHIE, by C. Fabre, D.Sc. Volume I., part V., completing the volume of 512 pages. Published on subscription by Gauthier-Villars et Fils, Paris.

This part of the exhaustive treatise by Dr. Fabre opens with a description of the procedures for testing lenses, determination of the principal focal distance by experiment and by calculation, determination of the principal focal points and of the optical axis of lenses. The depth of focus is shown to depend on the form of the principal focal surface, and methods are given for measuring the maximum plane field covered by a lens, the angle embraced by this field, and the useful depth of the field.

The sixth chapter of twenty-five pages is devoted to the considerations which should govern the choice of lens and camera for applications to portraiture, groups, landscapes, architecture and copying, and valuable suggestions for the use of the instruments, especially in the selection of lenses and diaphragms adapted to the character of the work to be undertaken. Then follows a chapter on the time of exposure and its relations to the coefficients of distance and of illumination.

Book second, with which the volume is ended, consists of a chapter on the studio, its construction and lighting by natural and artificial means, and on the laboratory, the dark room, the printing room, and the mounting room, each receiving separate consideration. Full attention is given to the selection of points of view and manner of lighting, so that the result shall not only be satisfactory as far as accuracy is concerned, but that it shall possess artistic merit, whether the work be in the studio or in the field.

AT a meeting of the Belgium Photographic Society on the second of September, comparative experiments with different developers were made; the substances compared together were pyrogallol, ferrous oxalate, hydroquinone and ikonogen, and the latter was found to give the softest negatives.—*L'Amateur Photographe.*

DECEMBER BARGAIN LIST.

42 Select Lantern Slides, mostly foreign, very cheap.

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1—15-in. Oscillating Burnisher, . 10 00
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1—Walmsley Reversible Finder 2 50
1—9x11 Glass Bath and Dipper . 1 80
1—Packard Rock 3 00
1—8x11 Exterior Background, light right 8 00
1—Card size Burnisher 3 00
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1 copy About Photography and Photographers 50
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1—15-in Entrekin Rotary Burnisher 17 00
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1—Fuming Box 4 00
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1—15x18 Japan Tray 50
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1—Seavey Swiss Cottage Accessory 12 00
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2—Spencer Head-rests 5 00
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Photo Mosaics for 1883, ... 20
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1—8x10 Hough's Exterior ground, light right 8 00
1—Hough's Oak Stump 7 50
1—Osborne's No. 71 Rock Accessory 9 00
1—Osborne's Bridge Accessory . 8 00
1—Osborne's Gate Combination Accessory, new 18 00
1—Knickerbocker Camera Stand, with Acme top 5 00
1—6x6 Children's Fancy Ground 3 00
1—15 inch Smith & Pattison, Quadruplex Enameler, ... 25 00

Camera Boxes:

1—8x10 American Optical Co.'s Portrait Camera, double swing 16 00
1—4 x 5 Waterbury Detective Camera, fitted with Roll Holder, and Plate Holder, in good condition, ... 18 00
1—Gray's Vest Camera 9 00
1—Woodward Solar Camera, 7-in. condensing lens and ½ size Voigtlander lens 25 00
1—½ size Ferro. Camera, 4 ⅛ tubes and stand 10 00
1—4x5 Flammang revolving back Camera, lens and tripod, new; reduced from $37 to . . . 25 00
1—17x20 American Optical Co.'s Double Swing Portrait Camera, Bonanza Holder, good as new 75 00
1—5x8 Blair View Camera, single swing 17 00
1—Climax Outfit, including chemicals, complete 3 50
1—17x20 D. S. View Camera, good condition 40 00
1—5x8 Tourist Outfit, including 5x8 Tourist Camera Box, 2 Daisy Plate Holders, 1 Extension Tripod, and 1 Canvas Carrying Case, very little used. Price, new, $40.50, will sell for 30 00
1—10x12 Cone View Camera, Double Swing, new 52 80
1—5x8 Wet Plate Stereo Camera, 3 holders, case and tripod 25 00
1—6½ x 8½ View Camera and Lens, ... 12 00
1—6½x8½ American Optical Co. first qual. View Camera . . 23 00

1—4¼x5½ Ex. qual. Portrait Camera 17 50
1—5x8 American Optical Co. Stereo Camera 25 00
1—5x8 Blair Compact Camera, good as new 35 00
4—5x8 Feather Weight Holders, each 75
1—8x10 Double Swing Cincinnati Portrait Camera 18 00
1—5x8 '76 View Camera, with lens holder, case and tripod 15 00
1—4x5 Anthony's View Camera, with lens, tripod, camera case and six double holders in good condition 16 00
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1—43 B. Climax Portrait Camera 8x10 with Benster Holder, . 20 00

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1—¼ size Darlot Portrait Lens, 5 00
1—¼ size Harrison Lens . . . 5 00
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1—5x8 Morrison Wide Angle Lens, ... 18 00
1—4-4 Harrison Portrait Lens . 18 00
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1 set ⅛ Tubes 18 00
1—11x14 Zentmayer Lens, with all the smaller combinations . 50 00
1—Matched pair E. A. Stereoscopic Lenses 8 00
1—14x17 Voigtlander Portrait Lens 60 00
1—No. 9, 11x14, Ross Portable Symmetrical Lens 60 00
1—11x14 Harrison Double View Lens 15 00
1—4x5 J. A. K. Single View Lens 2 00
1—Extra 4-4 Roettger Portrait Lens 20 00
1—2A Dallmeyer Lens 82 00
1—14x17 Roettger Lens 45 00
1—8x10 Beck Lens, good as new, fitted with Prosch Shutter . 55 00
1—set ¼ Darlot Tubes 13 00
1—4-4 Holmes, Booth & Hayden Portrait Lens 25 00
1—½ size Voigtlander Lens . . 25 00
1—⅓ size L. W. Krantz Portrait Lens 12 50
1—⅓ size C. C. Harrison Portrait Lens 8 00
1—½ size Darlot quick acting Portrait Lens, central stops . 18 00
1—No. 6, 17x20 Darlot wide-angle Hemispherical Lens 33 00
1—8x10 Voigtlander Portrait Lens 80 50
1—4-4 Dallmeyer Group Lens . 50 00
1—4-4 Walzl Portrait Lens . . 20 00
1—¼ size Harrison Portrait Lens 5 00
1—½ size Voigtlander Portrait Lens 12 00
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